CLAIMS:

What is claimed is:

1. A method comprising:

receiving content for transmission from a plurality of transmit antennae; and

generating a rate-one, space-frequency code matrix from the received content for transmission via the plurality of transmit antennae.

2. A method according to claim 1, wherein the received content is a vector of input symbols (**s**) of size *Nc* x 1, wherein *Nc* is the number of subcarriers of the multicarrier wireless communication channel.

3. A method according to claim 2, the element of generating a rate-one space frequency code matrix comprising:

dividing the vector of input symbols into a number *G* of groups to generate subgroups; and

multiplying at least a subset of the subgroups by a constellation rotation precoder to produce a number *G* of pre-coded vectors (v_g).

4. A method according to claim 3, further comprising:

dividing each of the pre-coded vectors into a number of *LM* x *1* subvectors; and

creating an *M* x *M* diagonal matrix $D_{s_g,k} = diag\{\Theta^T_{M\times(k-1)+1}\mathbf{s}_g,\cdots,\Theta^T_{M\times k}\mathbf{s}_g\}$, where *k=1...L* from the subvectors.

5. A method according to claim 4, further comprising:

interleaving the L submatrices from the G groups to generate an M x Nc space-frequency matrix.

6. A method according to claim 5, wherein the space-frequency matrix provides $M N L$ channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M, receive antenna(s) N and channel tap(s) L.

7. A method according to claim 1, wherein the space-frequency matrix provides $M N L$ channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M, receive antenna(s) N and channel tap(s) L.

8. A storage medium comprising content which, when executed by an accessing communications device causes the communications device to implement a method according to claim 1.

9. An apparatus comprising:

a diversity agent to receive content for transmission via a multicarrier wireless communication channel, and to generate a rate-one, space-frequency code matrix from the received content for transmission on the multicarrier wireless communication channel from a plurality of transmit antennae.

10. An apparatus according to claim 9, wherein the received content is a vector of input symbols (s) of size *Nc* x 1, wherein *Nc* is the number of subcarriers of the multicarrier wireless communication channel.

11. An apparatus according to claim 10, the diversity agent further comprising:

a pre-coder element, to divide the vector of input symbols into a number *G* of groups to generate subgroups, and to multiply at least a subset of the subgroups by a constellation rotation pre-coder to produce a number *G* of pre-coded vectors (v_g).

12. An apparatus according to claim 11, the diversity agent further comprising:

a space-frequency encoding element, responsive to the pre-coder element, to divide each of the pre-coded vectors into a number of *LM* x *1* subvectors, and to create an *M* x *M* diagonal matrix $D_{s_g,k} = diag\{\Theta^T_{M\times(k-1)+1}\mathbf{s}_g,\cdots,\Theta^T_{M\times k}\mathbf{s}_g\}$, where *k=1...L* from the subvectors.

13. An apparatus according to claim 12, wherein the space-frequency encoding element interleaves the *L* submatrices from the *G* groups to generate an *M* x *Nc* space-frequency matrix.

14. An apparatus according to claim 13, wherein the space-frequency matrix provides *M N L* channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) *M*, receive antenna(s) *N* and channel tap(s) *L*.

15. An apparatus according to claim 9, wherein the space-frequency matrix provides MNL channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M, receive antenna(s) N and channel tap(s) L.

16. A system comprising:

a number M of omnidirectional antennas; and

a diversity agent, to receive content for transmission via a multicarrier wireless communication channel, and to generate a rate-one, space-frequency code matrix from the received content for transmission on the multicarrier wireless communication channel from at least a subset of the M omnidirectional antennas.

17. A system according to claim 16, wherein the received content is a vector of input symbols (s) of size Nc x 1, wherein Nc is the number of subcarriers of the multicarrier wireless communication channel.

18. A system according to claim 17, the diversity agent further comprising:

a pre-coder element, to divide the vector of input symbols into a number G of groups to generate subgroups, and to multiply at least a subset of the subgroups by a constellation rotation pre-coder to produce a number G of pre-coded vectors (v_g).

19. A system according to claim 18, the diversity agent further comprising:

a space-frequency encoding element, responsive to the pre-coder element, to divide each of the pre-coded vectors into a number of LM x 1 subvectors, and to create an M x M diagonal matrix $D_{s_g,k} = diag\{\Theta^T_{M\times(k-1)+1}\mathbf{s}_g, \cdots, \Theta^T_{M\times k}\mathbf{s}_g\}$, where $k=1...L$ from the subvectors.

20. A system according to claim 19, wherein the space-frequency encoding element interleaves the L submatrices from the G groups to generate an M x Nc space-frequency matrix.

21. A system according to claim 20, wherein the space-frequency matrix provides $M\,N\,L$ channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M, receive antenna(s) N and channel tap(s) L.

22. A system according to claim 16, wherein the space-frequency matrix provides $M\,N\,L$ channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s) M, receive antenna(s) N and channel tap(s) L.